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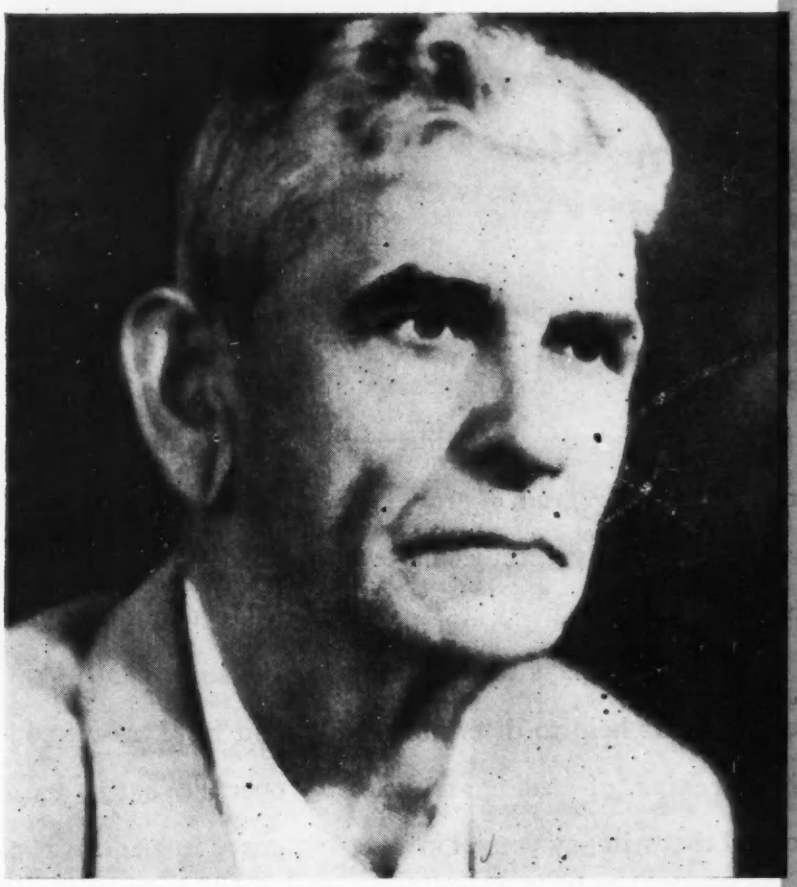
Citrus Industry



FRANK STIRLING (Deceased)
Late President of the Florida State Horticultural Society and
Prominent in Florida Citrus Circles

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Vol. 30, No. 12 December, 1949

but my grove problem is DIFFERENT!

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Purple Mite Outlook For Citrus In December, 1949

J. T. GRIFFITHS, JR., AND
W. L. THOMPSON

Cool nights have been prevalent throughout November and the days have generally been warm. These conditions coupled with dry weather have been very satisfactory for the development of purple mite infestations. A number of calls have already been received at the Citrus Experiment Station concerning purple mite damage and mesophyll collapse and leaf drop have been experienced in some areas. In no instance that we have observed has this been severe over large blocks, but it is an indication that we may expect more severe injury as time progresses. Since this is true, the citrus grower is faced with purple mites as his primary spray problem for the month of December.

DN is the only satisfactory material on the market in Florida for use at this time of year. It may be applied either as a 1 percent dust or sprayed at 2/3 of a pound of DN per 100 gallons of spray material. In both cases it should be mixed with sulfur. During the 1948-49 winter the results with DN dust were unsatisfactory in many instances. One reason for this was the fact that the dusts were not applied until heavy mite populations were already present. Inadequate coverage was also an important consideration. Dusters will ordinarily not do as thorough a job as sprayers. In addition to this, 1 percent DN dust does not have the same amount of DN per pound of sulfur as will be used in sprays. Thus, where a pound of sulfur is used per tree with the 1 percent dust actually less DN is applied per tree than if 10 gallons of spray had been used per tree. This means less DN, it is less evenly distributed, and therefore control would be expected to be less satisfactory. If dusts are to be used, extreme care should be taken that adequate dosages are applied.

When control is undertaken during early December, it should be anticipated that a second application may be necessary during the late winter or early spring. Past experience has shown that a single application this early will not necessarily insure low purple mite infestations up until April and May. This should be realized and the groves should be checked following this application in order to insure that reinfestation does not occur. Applications after the 15th or 20th of December have sometimes been satisfactory and have carried throughout the spring season. This is not always true and again these groves should be checked periodically later in the winter and early spring.

The question has come in from several growers as to the possibility of making a spray application in December do for the regular DN, zinc-sulfur dormant spray. It is the feeling at the Citrus Station that zinc used in early December will not be as efficiently used as it would be if applied later in the year. This is due to the fact that rainfall throughout January will wash the zinc from the trees and also the trees are in a more dormant condition at that time than at any other during the year. As a result of this fact it is suggested that the 20th to the 25th of December would be the earliest that zinc should be included. If a subsequent application does not go on during the dormant period the zinc may be used in the regular post-bloom spray and combined with copper and wettable sulfur. Sprays in early December should definitely not include zinc where maximum benefits from zinc are desired.

In planning the winter spray and dust program and where two applications are anticipated, it is suggested that at least one be a dust. The dust would be preferable at a time when mite populations are still low. It could be followed with a spray or dust again in late January or early February. Another alternative is to use the spray now, and then dust if necessary at a later date. For more complete information consult the Florida Citrus Experiment Station at Lake Alfred.

QUARTER-CENTURY PINS

Beautiful gold-filled pins were presented by the Columbia County Commissioners recently to 20 women who have been members of home demonstration clubs for a quarter of a century or more, according to Mrs. Glenn M. Sewell, home agent. Chairman H. J. Witt made the presentation.

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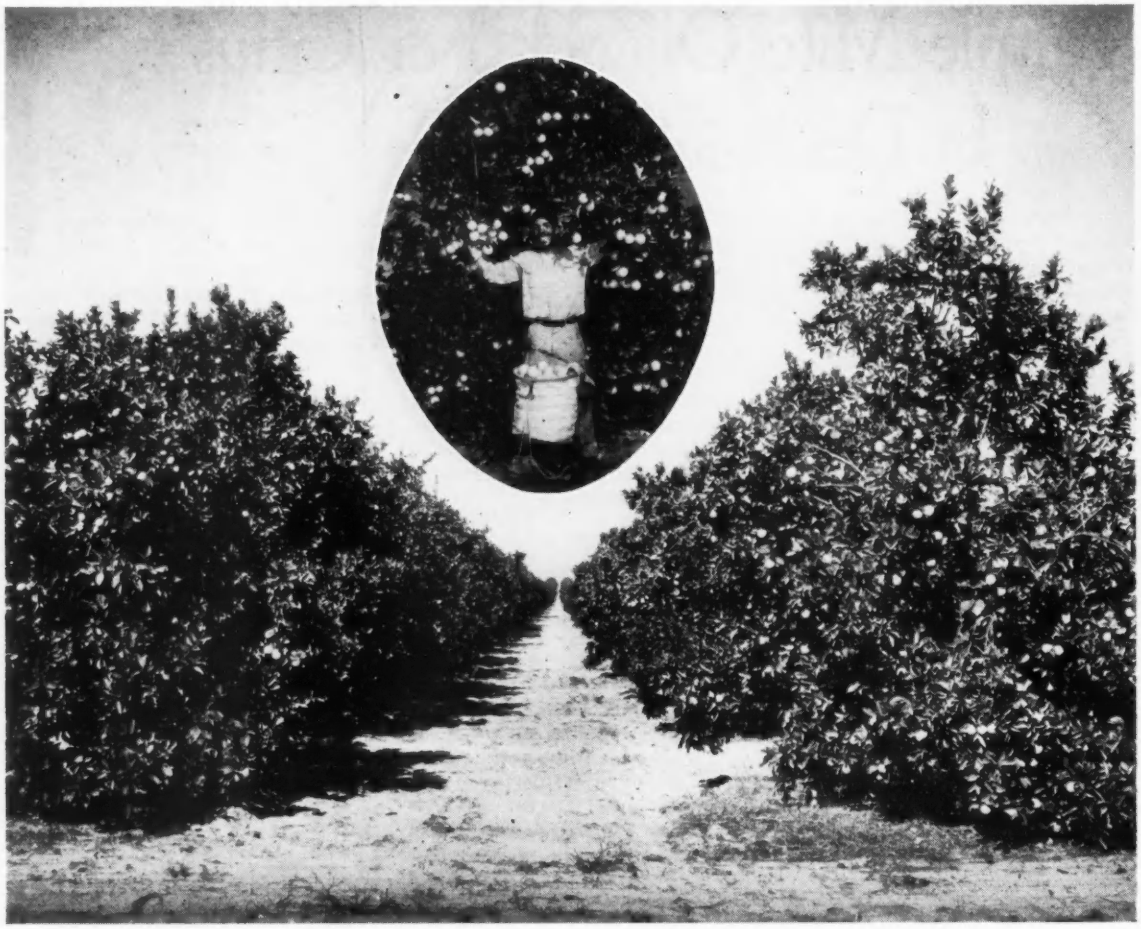

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President's Annual Address

FRANK STIRLING
AT MEETING FLORIDA STATE
HORTICULTURAL SOCIETY

From the time since Dudley W. Adams, first President of this Society, who addressed this group in 1888 it has become the duty of the President, at each annual meeting to present to you an address. The subjects selected by the various Presidents have covered a great many topics. In fact if all the President's addresses were compiled in book form, that alone would make an exceedingly interesting book which would cover a very great deal of Florida's horticultural history.

I don't think it would be out of line at this time to mention the names of the Presidents of this Society who have presided during the past sixty one years since its organizational meeting at Ocala. Thirteen of them, fourteen including myself. I am listing their names in accordance with their terms of service: Dudley W. Adams, Geo. L. Tabor, C. T. McCarty, P. H. Rolfs, W. C. Richardson, H. Harold Hume, L. B. Skinner, John S. Taylor, C. W. Lyons, Chas. I. Brooks, H. C. Hendricksen, F. M. O'Byrne and Wm. Ward. While most of these men served for more than one year each, the honor of holding the Presidency for the most number of years goes to H. Harold Hume who served from 1910 until 1922, a period of thirteen years. Dudley Adams, the first President, served nine years.

Throughout the history of this Society the yearly Proceedings have recorded the many changes and advancements along the lines of horticulture and other phases of agriculture. These changes have been for the improvement and betterment of the state. Many of these changes were necessarily made as a result of some natural disaster, for instance prior to the Big Freeze of 1894-95, King Orange had held forth for a number of years. At that time but few had ever thought to try to grow any thing other than oranges and when the groves were frozen to the ground most of the growers gave up, abandoned their property and left the country leaving only the most hardy to carry on. Thereafter, for the next decade or two turpentine became king. In the meantime those horticultural pioneers who remained engaged themselves in trying to see if something other than citrus could be profitably grown, men who felt that Florida soil held secrets which when ferreted out would again put the state on a profitable basis. These men, all of the type indicated by those who have constantly strived for knowledge of what the soil could do soon began to show results, for instance word was spread that in the Sanford area celery could be grown about as well as at Kalamazoo and reports of big profits per acre were made. Then at Hastings, over in St. Johns County, fortunes were being reportedly made in growing Irish potatoes. Still later in the Manatee County area, the Lake Okeechobee country and the East Coast, carloads and even train loads of winter grown truck crops began rolling to northern markets.

But few of you remember seeing in the northern portion of the state, as you rode along on the train from Jacksonville to Pensacola, the carcases of many, many dead pear orchards. Many years ago hundreds of acres of soft skinned pears were planted and that industry began to look promising, but not for long for the fire blight of pears, a deadly disease, made its apperance which finally destroyed that industry. About the same time and in the same area a tremendous effort was made to establish the business of growing Satsuma oranges, figs and Japanese persimmons, but for various difficulties, mainly freezes and disease, those industries were prevented from amounting to any thing really important. But the wreaking of these horticultural endeavors did not stop the growers from going ahead and experimenting with other crops. In this same area, today, may be seen many, many acres of Tung tree orchards yielding a profitable return in Tung Oil to the growers. This, just another example of dilligent delving into possibilities for growing crops which were unthought of before natural disasters undid those that had been unsuccessful before.

Until recent years this Society has stressed the citrus phase of horticulture, had concentrated upon the need for producing more and better citrus fruits, but today the great variety of agricultural products becoming

(Continued on page 16)

Citrus Cover Crops . . .

FRED P. LAWRENCE
HORTICULTURIST

AT MEETING OF FLORIDA STATE HORTICULTURAL SOCIETY

Mister Chairman, Ladies and Gentlemen, I find myself quite in the position of the farmer who was walking down the road pulling a plow line through his hand and muttering, "I'm confused." He continued to do this until finally some one asked him why he was confused. "Well," he said, "I don't know whether I've found a plow line or lost a mule." So it is with me, I'm confused. There are so many things I would like to say that I hardly know where to begin.

First of all I wish to express my appreciation to Bob Norris, Lake County Agent, Marcel Boudet, Indian River County Agent, and to the growers who have cooperated in establishing demonstrations and allowing us to observe and collect data from them.

I am especially indebted to Bob, for he not only has been instrumental in getting demonstrations set up, but he also has helped do the actual work of measuring, weighing, and collecting the few data we have.

When a large number of citrus groves are examined, it will be found that the groves which have made the best growth and look the best are the ones that have received the most careful attention. Usually these groves are the ones in which cover crops have been grown almost continuously. Why is this?

The changes that are constantly taking place in the soil may be grouped as physical, chemical, and biological. The first relates to movement of water. The second, includes changes brought about by the decomposition of organic matter. The third, or biological change is that caused by soil microorganisms. All three changes, whether physical, chemical or biological, are immediately associated with the presence of organic matter in the soil.

Soil organic matter or humus may be supplied through the purchase of such organic plant foods as dried blood, castor pomace, tankage, and bone meal. These are good materials, but the available supply has been limited in some cases and the cost is always high. Florida growers today are in no position to use high-priced materials if lower-priced ones will do the job equally as well—or even nearly as well. Low-cost organic matter is obtainable in groves simply by the use of an adequate system of cover crop production.

We know from years of research and practical experience that cover crops are vauable in soil management. We have come to the conclusion that the organic matter added by cover crops is valuable because:

1st: It increases the base exchange capacity of the soil.

2nd: It increases the water-holding capacity of the soil.

3rd: It improves the tilth.

5th: It retards erosion.

5th: It stimulates beneficial bacterial life.

6th: It helps to maintain a high humidity and to moderate the temperature.

7th: It helps to conserve natural and applied fertilizers and, 8th: It adds nitrogen to the soil if a legume cover crop is used.

Florida's sandy soils are especially in need of organic matter to enable them to withstand our relatively high temperatures and heavy rainfall and to continue productive.

Florida growers long have been wise to these facts and have altered cultural practices many times in the past 50 years, especially in recent years.

For many years before the depression of the early Thirties, Florida growers had tried various cover crops in citrus groves. Many went so far as to mow the road sides and to haul the hay to their groves for mulching but the cost and fire hazards proved too great.

About 1930 Crotalaria striata became very popular as a cover crop, and it appeared to be exactly the plant the grower had been seeking. It gave high tonnages of green material that was relatively high in nitrogen. This plant proved very popular; in fact it was instrumental in bringing many young groves through the depression when most growers were forced to materially reduce their fertilizer programs or leave them off altogether. Then Crotalaria spectabilis, a more succulent plant, was introduced and for a while it looked very promising. For some reason, however, both of these crotalarias began to fail to re-seed themseves and, too, they provided feed and harborage for pests that also attacked citrus trees—this was before we had the modern pesticides so by the early '40's we were again almost dependent on grasses and other native plants for a cover crop to furnish our soils with the greatly needed organic matter. This situation existed until comparatively recently.

In 1931 Dr. Fred Hull of the Florida Agricultural Experiment Station discovered a lone plant growing near a coal pile near the experimental plots in Gainesville. He pointed this plant out to Professor G. E. Ritchey who became interested in it so much that he staked it and cared for it until it produced seeds. These seeds were carefully planted. The plant to which I refer is Indigofera hirsuta, commonly known as Hairy Indigo. This process of re-seeding was repeated many times, with the seeds multiplying each year until about 1944, when he had sufficient seeds available to put them on trial with growers. The plant did not "catch on" until the late '40's but at this time it looks exteremely promising as a re-seeding leguminous cover crop for citrus groves, and, too, the truck farmer and the cattle rancher appear to have found a friend in indigo. Recently I had the privilege of going on a county tour where we saw indigo growing for the citrus grower, the cattlemen, and the general farmer. One rancher was obtaining pasture as cheaply as I have ever seen. His land was predominantly deep-phase, Lakeland fine sand. He was renting the wooded area to watermelon farmers who cleared it and produced a crop of melons. Following the melons the grower sowed indigo in the middles to utilize the residual fertilizer from the melon crop to give his indigo a good start. Then, during the late summer rains, he was broadcasting Pangola grass in the strips or middles between the indigo so the Pangola could get the nitrogen that was released by the indigo. Incidentally, he found that his cattle was grazing the indigo and putting on very creditable gains while his Pangola grass was getting established.

The plant is highly resistant to root-knot. It is not a desirable host for the pumpkin or stink bug and it gives a comparatively high tonnage of green manure per acre. Yields of slightly over 22 tons green weight per acre have been checked. However, it appears that under average conditions the yield should be from 15

to 20 thousand pounds per acre in young groves. So far, the plant has shown great promise. It re-seeds itself and it requires no inoculation and special fertilization. Its chief drawback in citrus is its late seeding. Usually it is mid-October before satisfactory seed spikes are produced.

In 1943, an early maturing strain of indigo was introduced and although it has not become widely used, it appears to possess about the same characteristics as the late except it produces mature seeds a little earlier than does the late and will probably give a little less green manure tonnage.

Now, let's consider some of the data and grower comments that we have gotten on indigo as a citrus cover crop. In doing so, I want to point out that these data are the result of field observations on grower demonstration plots.

In 1947, several growers agreed to set up demonstrations to determine the value of indigo versus native cover crops. In 1948 we began to take samples by which we were able to estimate the green weight yield per acre of the crop and also the probable poundage of nitrogen returned to the soil by the crop. The nitrogen figure looked so astounding that many growers decided to vary the poundage of applied nitrogen to see if their trees were actually getting any of this "free" nitrogen. Here are some of the figures and some comments from a few of the interested growers.

Grove A was planted in 1944, 45 and 46. It contains three ages of trees and also three varieties, Hamlin, Valencia, and Temple oranges, all on rough lemon stock. The grove is planted on a rolling phase of Lakeland fine sand.

Indigo was broadcast in the spring of 1947, a good crop was produced, and allowed to go to seed. It volunteered in 1948 and was chopped once in June. The crop was weighed in September and the green weight yield per acre was 15,824 pounds. Figuring the nitrogen content of this amount of material, we found that it returned 93 pounds of nitrogen per acre, or the equivalent of 583 pounds of nitrate of soda per acre. The crop was cut under in late October 1948.

The indigo volunteered again in 1949 and was not cut under. When it was weighed in September we found a green weight yield of 40,000 pounds, with a total nitrogen content of 236 pounds per acre—equivalent to 1416 pounds of nitrate of soda.

The caretaker for this grove reported that the grove received a normal application of fertilizer until 1948, when he cut the total fertilizer applied in half and has continued to apply half the customary amount of fertilizer since that time. He said the grove growth is as good or better than in a nearby grove of the same age that received the normal program but does not have indigo as a cover crop.

Grove B is planted to Hamlin oranges on rough lemon stock, 20x30 feet, on Lakeland fine sand. It was planted in 1944.

This grove was first seeded to indigo in 1947. That year the seed crop was combined and sold but sufficient seed was left to give an excellent volunteer stand in 1948. This grove is chopped twice each year. The first chopping is done in the summer when the indigo is about 3 feet high. Then the indigo is chopped under in the fall.

In 1948, the crop was chopped in the summer and yields were taken in September. From this cut-over or second growth the yield was 19,227 pounds green weight—equivalent to 113 pounds of nitrogen per acre.

Essentially the same program was followed in 1949, but this time the green weight yield was 26,550 pounds, or 156 pounds of nitrogen per acre.

The owner of this grove reported that this land was so "thin" when he planted his trees that a 4-wheel drive Jeep could not get about in the grove, but now there is so much organic matter in the soil that he can drive his car almost anywhere in the grove.

He figured the cover crop was returning considerable nitrogen to the soil, so in 1949 he established three rows across the grove with no nitrogen and three rows with only half the customary nitrogen. The balance of the grove is still on a full program. To date he has noted no significant difference in the tree growth and yield in the various plots.

Grove C is planted to Hamlins on rough lemon stock. It was seeded to indigo in 1947 and there was a good volunteer stand in 1948. The second year stand, uncut was 27,905 green weight or 164 pounds nitrate per acre or 1,028 pounds nitrate of soda equivalent.

In 1949, the third year volunteer crop produced 26,250 pounds or 154 pounds of nitrogen per acre.

The crop was not cut under during the summer of 1948, but it was cut in the summer of '49. Thus the date for 1949 represents the yields of the second growth crop.

The owner of this grove is a foreman of a large packing house and he reported that it has been his experience that the fruit coming from the blocks of his grove that were planted to indigo have constantly had higher solids than those from blocks where there was no indigo. He has checked this for two years. He further reported that there is an insignificant difference between maturity dates, but he feels the indigo plots will pass as quickly each year as the check plots.

Grove D was planted in December 1944 to early and late varieties on sour orange stock. The soil type is Eustis Fine sand.

Hairy Indigo was planted in May, 1946, at the rate of 4 pounds per acre with a cyclone seeder. Three rows were left as a check block.

Indigo has volunteered each spring. The grove was disked for the last time June 10th this year.

Cultural practices are identical throughout the grove except for the check block which has no Indigo. The trees in the check plot were very yellow when yields were measured, on September 15th. The trees having indigo were a deep green and were producing a luxurient fall flush of new growth. The indigo produced 12,500 pounds of green weight per acre.

In spite of the spring drouth the unirrigated indigo blocks bloomed and set a very uniform crop before the check rows bloomed.

The indigo blocks matured their fruit about 10 days ahead of the check plots. And here's a summary of maturity tests run and comments by the tester:

	Hairy indigo	Check
Acids	.79	.79
Total Solids	9.31	9.24
Ratio	11.81	11.50

"The test was taken September 15, 1949. The oranges planted in indigo are greener in color, rougher skinned, not ricey inside and are sweet in taste. The oranges in the check rows are lighter in color, smoother skinned, are a little ricey inside and are not as sweet and have a decided bitter taste. An average of juice content shows the oranges at size 250 in the indigo to have 25% more juice than those of the same size in the check rows. The trees in the indigo are approximately a year advanced in size and are much greener in color."

Similar data from several other groves are available but I will not go into them now. From the data we have and observations, we who have worked with it and observed it believe hairy indigo is certainly the friend of

(Continued on page 17)

Plant Quarantine Enforcement From A Customs Viewpoint

A. C. WATSON, JR.,
ASSISTANT CUSTOMS COLLECTOR
DISTRICT NO. 18, AT MEETING
FLORIDA STATE HORTICULTURAL SOCIETY

I am not a practical farmer, nor have I been educated in horticulture and agriculture. However, having been in close contact with the plant quarantine work since 1915 and knowing many of the officials and inspectors over a long period of years, I have learned of the many problems confronting the organization in the enforcement of the plant quarantine laws and in the protection of our horticultural and agricultural interests.

Before entering into the discussion which is the subject of this paper, I believe a brief resume of the duties of the Customs Service and its relation to the enforcement of the quarantine laws may be of interest.

The Customs Service is a branch of the Treasury Department and one of the oldest services of the government. It is charged with the collection of duties imposed by the Tariff Act as modified by trade agreements on merchandise imported from foreign countries; in preventing the introduction of articles made by convict, forced or indentured labor; of treasonable, obscene or lascivious articles, pictures, books or prints; of gold or silver which may be falsely or fraudulently marked; of articles bearing trade marks or trade names without the consent of the trade mark owners; of copyrighted books without the consent of the copyright owners; of viruses and serums except from institutes duly licensed; of wild animals, insect pests and birds except under permit; of plant products from infested countries or except under permit; of livestock from countries infected with rinderpest or foot and mouth disease; of the plumage or parts of wild birds; of seal skins taken in other than treaty waters; of opium and narcotic drugs; of counterfeit coins, obligations or securities, domestic or foreign.

This Service is also charged with the enforcement of the neutrality laws; controls or prevents the exportation of arms and ammunition and strategic materials as proclaimed by the president and the Office of International Trade; and the importation and exportation of gold and silver except in conformity with presidential authority. The Customs Service acts as an enforcement agency in the prevention of the smuggling of merchandise into the United States and the sanitary requirements of the Public Health Service in connection with vessels and aircraft arriving from foreign countries.

In the performance of these duties the baggage of passengers arriving from foreign countries is examined; all vessels and aircraft engaged in foreign commerce are searched and required to enter and clear at the customhouse, reporting their cargoes and paying certain tonnage taxes and fees. The merchandise which forms the cargoes of such vessels and planes must be entered and duty paid thereon before release or bonds given for the security of such payment.

The collectors of customs grants marine documents authorizing vessels to engage in foreign and domestic commerce and is the recorder of bills of sale, mortgages, hypothecations and liens involving American vessels. As a recorder his acts are comparable to those of a recorder of deeds of real property; he maintains similar records and issues certificates of record of title which resemble and serve the same purpose as an abstract on real property.

Prior to the passage of the Income Tax Act of 1916, the Customs Service was primarily a collecting agency and duties of importations were the major source of revenue of the United States. Since the passage of the income tax law, the revenue derived from customs duties have been small in comparison with the total revenue of the United States. For the last fiscal year approximately $450 million was collected from customs duties.

Thus it will be seen that the original functions of the Customs Service have materially changed. While it is still a collection agency, its most important' functions are of an enforcement nature.

The organization of the Customs Service consists of the Bureau headquarters at Washington and a field service. The United States and its insular possessions for administrative purposes are divided into 46 collection districts, which include one in Alaska, one in Hawaii and one in Puerto Rico. These districts usually embrace one state although on the Mexican and Canadian borders states may be divided into several collection districts and in the interior several states are embraced in a single customs collection district. On the seaboard, generally each state is a customs collection district.

The administrative affairs of each district are supervised by a collector of customs appointed by the president by and with the consent of the senate. District No. 18 embraces all of the waters, shores and territory of the state of Florida including the northern bank of the St. Mary's River. There are 15 ports of entry in this state, to wit, Fernandina, Jacksonville, St. Augustine, West Palm Beach, Port Everglades, Miami, Key West, Boca Grande, St. Petersburg, Tampa, Apalachicola, Carabelle, Port St. Joe, Panama City and Pensacola, the headquarters office being at Tampa where the collector resides.

Hororable Boyce A. Williams of Leesburg, Florida, is the present collector for the Florida district. He is a long-time resident of this state, is a large grove owner, has had considerable governmental experience, and I am quite sure is known to many of you. He is vitally interested in the welfare of Florida and in the protection of our agricultural and horticultural interests. It is with his consent and at his request that this paper is being written.

One of the most important preventive duties performed by Customs is the enforcement of the Plant Quarantine Act of 1912, as amended. While representatives of the Department of Agriculture have the authority by law to board and search vessels, because foreign commerce is controlled generally by customs, it was early realized that effective enforcement of the federal and state plant quarantines depended in a large measure on the close cooperation of customs and plant quarantine officials.

Florida, by reason of its geographical location, is especially exposed to invasion by tropical plant pests. It is

but a short distance to the Bahamas, Cuba and other West Indian islands and the South and Central American countries where plant pests exist which are not prevalent in our country. The climate of Florida is similar to that of these countries, and pests transplanted to Florida indeed thrive, better in fact than in the country of habitat since natural enemies are not present during the early stages of any infestation.

Systematic methods of protection of our agriculture and horticuture are of comparatively recent origin, and unfortunately many pests and diseases had been imported or introduced into this country before the Congress realized the conditions existing and passed the federal plant Quarantine act of August 20, 1912.

This act, as amended, among other things premits the Secretary of Agriculture to gather information concerning the existance of pests and plant diseases in foreign countries and the several states of the union including territories and possessions of the United States; to issue quarantines against localities for the several types of materials which may be hosts for such insects and diseases. It also provides a system for the prevention of the introduction of infested plant material and the submission of all plant material if necessary to personnel qualified and experienced in agricultural and horticultural affairs before release thereof from customs custody.

Recognizing the necessity of supplementing the efforts of the federal government and because of the appearance of citrus canker in this state, the Florida legislature passed the Plant Quarantine Act on April 30, 1915. This law was amended in 1927 to conform to certain decisions of the Supheme Court but no startling or revolutionary changes were made.

Shortly after the passage of the Plant Quarantine Act of 1915, Dr. J. H. Montgomery was appointed in charge of the Quarantine Section of the State Plant Board under Dr. Wilmon A. Newell, the Plant Commissioner. These gentlemen concluded that adequate enforcement could be attained only by the state employment of quarantine inspectors who would enforce the state quarantines and collaborate with the Department of Agriculture in the enforcement of the federal plant quarantines.

Both Drs. Montgomery and Newell were practical men, well versed in the science of agriculture and horticulture. Great care was exercised in the selection of the quarantine inspectors. Many were graduates of agricultural colloges having special knowledge of plant pests and diseases prevalent in Florida with experience in citrus canker and similiar work. All received technical training after employment. The qualifications for employment were high. In addition to the technical essentials, the inspectors were required to be of such a temperament as to be capable of dealing with the traveling public generally, ship's officers and crews, transportation employees, and customs and immigration officers .

Frequent conferences were held by Drs. Newell and Montgomery with customs officers and representatives of the Department of Agriculture, and close cooperation has always existed in Florida between these services.

Since Customs must examine arriving baggage, board and search vessels and examine stores, most of the actual examination work has been performed by officers of the Customs. However, representatives of the State Plant Board or the Department of Agriculture are always present at the baggage examinations, the searches of ships, etc., and plant material which may be found by customs officers is turned over to the quarantine inspectors for examination.

The two organizations have indeed worked harmoniously together. Plant Board inspectors are housed in federal buildings in space usually furnished by collectors of customs. They board ships and planes with the customs authorities and the two forces work together in all inspectional activities. On numerous occasions attempts to smuggle prohibited material, at times infested with destructive plant pests, have been frustrated by the vigilance of customs inspectors and port patrol officers. On the other hand, violations of the customs laws have been detected and reported by Plant Board inspectors.

Indeed one may well say that the keynote of these two organizations has been, "They best can work who best agree",

There are four principal means of introducing plant material into the United States from foreign countries:

1. Regular importations—that is, shipments made by freight and express and arriving by surface craft or aircraft.

The interception of infested of infected material is comparatively simple in these cases. In addition to the filing of a customs entry describing the material, its value, quanity and the duty thereon, a permit for the importation of plant products issued by the Secretary of Agriculture must be filed with the Collector of Customs. Packages are opened by customs officials and examinations made to determine whether the contents, value, weight and measure agree with the description appearing on the entry. Plant quarantine officials are present and if the plant products are admissible release thereof is accomplished.

Infested material is either destroyed or fumigated by quarantine inspectors. Because of the great increase in the importation of plant material at Florida ports, the Federal Department of Agriculture some two years ago established a fumigation station at Miami similar to the one existing in Hackensack, New Jersey. It is now possible for certain types of plants and plant products, including seeds, to be imported under permit, subject to fumigation at Miami. Previously such importations were required to be forwarded to Hackensack, New Jersey.

Customs officers note carefully the packing surrounding the merchandise and if of certain types delay delivery until such packing is passed by Quarantine officers. This is an important function since the pink boll weevil has been found in packing arriving from China while foot and mouth disease may be and probobly has been transmitted by straw used in the packing of merchandise imported into the United States.

2. Importations through the foreign mails.

Enforcement on importations by this means is fully covered and is effective. Mail packages are examined by customs officers and plant material found is turned ofer to the proper employee for inspection, destruction, fumigation or retuurn to the mail.

3. Sea stores.

Most of the sea stores subject to the Plant Quarantine Act carried by watercraft consist of staples such as rice, corn, yams, potatoes, green coffee, etc. The number of interceptions of plant material from stores, however, while smaller than in the case of baggage are large in economic importance. For example, the bean weevil, the yam weevil, and the bean pod borer, as well as other pests, have been discovered in vessels' stores.

At a port outside of Florida, a num- of active Mediterranean fruit fly larvae were found in fresh tomatoes contained in the vessel's stores.

Stores on aircraft at present have not presented a real enforcement problem since most of the meals are supplied by caterers at designated

(Continued on page 20)

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"A HOUSE DIVIDED"

It seems to us that we once read somewhere, or possibly we just heard it, that "a house divided against itself cannot stand." We hope that this does not apply to the citrus industry of Florida, yet it appears that we may be headed in that direction.

We have two schools of thought among the citrus interests of Florida. One school believes that the salvation of the industry depends upon a closely knit and powerful cooperative organization operated by and for the growers; the other school believes in rugged individualism carried to the extreme—which is all right as long as the two schools don't indulge in backstabbing, but all wrong when they do.

We have also two great organizations, one a state agency and one a collection of individuals, both designed to benefit the growers—the Florida Citrus Commission and the Florida Citrus Mutual. Both are needed, and as long as they work in harmony the growers will be the gainers. But an effort appears to be in the making to play the one against the other—which can only be bad for the growers.

The Florida Citrus Commission is needed, and badly needed, to carry out the laws and regulations governing the industry, to carry on research, to aid by advertising in the expansion of our markets, to act as a regulatory body over the varied interests of the industry.

The Florida Citrus Mutual is needed, and badly needed, to control marketing practices, to establish minimum prices, to prorate shipments, to act as regulatory agent for the growers by whom it is controlled and to whom alone it is responsible.

Acting in harmony, these two great organizations can be of inestimable benefit to Florida citrus growers. It is to be regretted that an effort appears to be in the making to introduce an element of discord between the two. It is to be hoped that the able men at the head of the two organizations will see that the effort is squelched before it is born. The Florida citrus industry has suffered all too long by reason of strife, division and disharmony among its various elements. It cannot afford now to permit discord to enter into the relations of its two great regulatory bodies.

A GREAT LEADER PASSES

In the death of Frank Stirling recently the citrus growers and other horticulturists of Florida have sustained the loss of a great leader and a true friend. For the greater part of his active life, Frank Stirling had been connected with the horticultural interests of Florida and always in a leading role. At the time of his death he was just closing a term as president of the Florida State Horticultural Society, in which organization he had for many years played an active part.

As the owner of citrus groves and the developer of varied horticultural interests, he was known throughout the state as one of the most progressive and far-seeing of the men who have pinned their faith and devoted their lives to the advancement of the horticultural interests of Florida. In his passing the state loses a loyal and noble citizen and the horticultural interests a great and worthy leader.

THE MARKETING SITUATION

As was to have been expected, the exceedingly high prices prevailing for Florida oranges at the outset of the shipping season have materially declined. That result was inevitable with the increased volume of shipments going into the auction markets later in the season when more fruit became available by passing the new maturity tests.

As this is written prices on the auction markets remain steady at the initial decline. The smaller sizes which were discriminated against by buyers early in the season are now being well received. The minimum on-tree prices established by Florida Citrus Mutual are being well maintained as are the prices for cannery fruit.

Grapefruit prices are holding up well. With a smaller than usual crop in Florida and with Texas shipping only meager amounts, this is understandable. With careful attention to marketing practices the season should prove a profitable one for grapefruit growers.

COURTS UPHOLD CITRUS CODE

The new Florida citrus code, popularly known as the "Warren law," and which was hailed in some quarters as the salvation of the industry and damned in others as its ruination, has so far withstood all efforts in the courts to displace it.

The code has been attacked in the courts by many fresh fruit shippers and by a number of canners, but so far the courts have upheld its provisions. It is anticipated that the higher Federal courts may be asked to pass upon some of its provisions.

That there may be inequities in the code is quite possible, but until the higher courts have passed judgment it is the law under which the industry must operate. If in practice it is found that changes are needed they should be made. This season's operations should demonstrate the need for such changes—or the lack of need.

The composite test for tangerines, recently approved by the Florida Citrus Commission, has been rescinded, having it is said served its purpose in moving the early bloom fruit. Much of the later bloom fruit is still being held back for maturity.

Preliminary Tests Of Fungicidally Active Compounds For The Control Of Stem-End Rot Of Oranges

CHARLES M. GATES
Research Fellow, University of Miami

Introduction

In recent years, workers in the field of plant disease control have turned to organic compounds in their search for fungicidal or fungistatic material. A good deal of the investigation has been in the form of laboratory assay by spore germination tests. Horsfall (1945) has listed a great many compounds that have been found to be fungicidal at least in vitro.

The control of stem-end rot of citrus fruit requires a different approach to the problem of disease control than the usual protective spray which is control before infection. In the case of both of the organisims involved, the fungus is often already established either in the stem, in the button, or in the fruit itself before the control measures are applied. Because of this, the fungicide used to control stem-end rot must be able to penetrate the skin of the fruit to be effective. This raises the problem of the possible toxicity of the residual chemical in the fruit, as well as injury to the rind and change of flavor of the fruit. With these problems in view, it was decided to make preliminary tests in vivo with inoculated oranges.

Review of The Literature

The occurrence of stem-end rot of citrus fruit has been reported since 1900. In 1911, Fawcett discovered one of the casual organisms to be a species of **Phomopsis.** It was identified as **P.citri** n.sp. by him in 1913. **Diplodia natalensis** Pole-Evans was discovered by Pole-Evans (1910) to be another causal agent and was named by him. Wolf (1926) showed that **P.citri** is the imperfect stage of **Diaporthe citri**

RESULTS OF PRELIMINARY TESTS OF COMPOUND FOR THE CONTROL OF STEM-END ROT OF ORANGES
TABLE I

Treatment	Solvent	No. Fruit	Percent Rot in Three Weeks Stem-End	Penicillium	Total
Control		450	87	12	99
3% Dibromo-8-hydroxyquinoline*	WA	100	66	0	66
2% Sodium-o-phenylphenate	W	100	11	0	11
2% o-phenylphenol	WA	100	3	0	3
2% Mark 4 disinfectant	W	50	81	19	100
3% 8-hydroxyquinoline (48 hrs. inc.)	WA	50	54	0	54
3% 8-hydroxyquinoline (24 hrs. inc.)	WA	50	8	0	8
3% 8-hydroxyquinolinesulfate	W	100	80	0	80
5% 8-hydroxyquinolinesulfate	W	50	0	0	0
5% thiourea (48 hrs. inc.)	W	50	100	0	100
5% thiourea (24 hrs. inc.)	W	50	0	0	0
5% diphenylthiourea	A	100	82	3	85
5% thioacetamide (48 hrs. inc.)	W	50	94	0	94
5% thioacetamide (24 hrs. inc.)	W	50	2	0	2
5% thioacetanilide (48 hrs. inc.)	WA	50	52	2	54
5% thioacetanilide (24 hrs. inc.)	WA	50	2	2	4
2% 2, 4, 5-trichlorophenol	WA	50	6	0	6
2% O-aminophenol	WA	50	14	0	14
2% o-nitrophenol	WA	50	68	0	68
2% p-nitrophenol	WA	50	8	0	8
2% sulfanilic acid	W	50	92	8	100
2% 2,4-dinitrophenol*	WA	50	4	0	4
1.5% 1,4-naphthoquinone	A	50	94	0	94
2% 2-methly-1,4 naphthoquinone	WA	50	70	2	72
2% 2-aminopyridine	W	50	80	20	100
5% 2-aminopyridine	W	50	8	0	8
3% allyformate	W	50	100	0	100
3% 5-sodium-8-hydroxyquinolinesulfonate	W	50	88	12	100
3% teteramethyl amoniumchloride	W	50	86	14	100
3% dehydroacetic acid	WA	50	20	4	24
3% aminoszobenzenehydrochloride	A	50	72	2	74
3% propionitrile	W	50	40	60	100
5% palmitic acid	A	50	72	0	72
5% myristic acid	WA	50	66	14	80
5% phenylurethane	WA	50	0	0	0
2% salicylaldoxime	WA	50	66	14	80
Uninoculated checks		195	8.5	1	9.5

* A 24 hour incubation time was used in all cases not hsown
W—Water
A—Isopropanol
WA—Diluted isopropanol

Wolf. In 1928 Bach and Wolf proved the pathogenicity of **P. citri** in citrus melanose by the isolation of the fungus from melanose lesions. Winston (1935) recommended the use of borax wash for reducing fruit decay. Miller et al (1944) used sodium-o-phenylphenate for control of stem-end rot. In 1944, Ramsey showed the inhibitory effect of diphenyl in vitro on **P.citri** and **D.matalensis.** Brooks (1944) suggested the use of sodium-o-phenylphenate for control of stem-end rot. In 1945, Childs reported the effectiveness of thioacetamide 8-hydroxyquineline and 2-aminothiazole, and in 1946 added thiourea to the list. In 1947, Siegler and Childs suggested the use of isopropanol soluble compounds for the control of citrus

TABLE II

Palmitic acid	28%
Dehydroacetic acid	76%
o-aminophenol	86%
Sodium-o-phenylphenate	89%
8-hydroxyquinoline	92%
p-nitrophenol	92%
2-aminopyridine	92%
2,4,5-trichlorophenol	94%
Thioacetanilide	96%
o-phenylphenol	97%
thioacetamide	98%
Phenylurethane	100%
8-hydroxyquinolinesulfate	100%

rots. Hopkins and Loucks (1947) got significant results with the use of 8-sodiumquinolate and 2-aminopyridine. Winston et al, (1947) used 2-aminopyridine successfully for control of stem-end rot.

Materials and Method

Due to the limitation of both time and space it was decided to inoculate the oranges used in the screening tests with both **P.citri** and **D.natalensis** so that significant results could be obtained on a relatively small number of fruit. The oranges were treated in lots of fifty each, with 200-300 fruit being inoculated each week. The tests covered a period from Dec. 1, 1948 to March 21, 1949, during which time the varieties in season were used. One lot of inoculated fruit was always left untreated as a check and some uninoculated fruit were retained as checks.

During the course of the tests the compounds which showed some control were tried again under different conditions of concentration or time of incubation before treatment. Compounds that gave excellent results in the first test were sometimes used again under the same conditions as a check of the original results.

Inoculation of the fruit was effected by cutting the rind at an angle close to the stem-end and dipping the fruit into a suspension of **P.citri** and **D.natalensis** cultures. The fruit was then incubated in a moist chamber for 24-28 hours before treatment. The incubation period allowed the fungi to become well established in the fruit and also allowed the cut to begin to heal before dipping in the fungicide solution.

Whenever possible water was used as a solvent for the fungicides. If a strong water solution could not be obtained ispopropanol in various concentrations was used as a solvent.

The inoculated oranges were treasted by dipping them for 1-3 seconds in the fungicide solution, the controls were dipped in distilled water. The fruit was then set aside on trays and stored at room temperature for three weeks. Counts of the number of rotted fruit were made twice a week and the rotten fruit was removed and discarded at that time.

From time to time isolations were made from treated rotten fruit to determine the fungus present and to check on the possibility of rot from some cause other than **Phomopsis or Diplodia.**

The oranges used in these tests were obtained from the groves of Carl J. Lindgren of Goulds, Florida, and Mrs. W. J. Krome of

TABLE III

THE PERCENTAGE OF FRUIT ROTTEN AT THE END OF THREE WEEKS AFTER TREATMENT WITH FUNGICIDE SOLUTIONS OF VARYING CONCENTRATIONS.

	Treatment	Total Rot
1%	0-phenylphenol	14
2%	"	16
3%	"	16
1%	8-hydroxyquinoline	28
2%	"	20
3%	"	6
4%	"	8
4%	8-hydroxyquinolinesulfate	26
5%	"	18
3%	Thioacetamide	8
4%	"	6
5%	"	8
3%	Thioacetanilide	6
4%	"	6
5%	"	6
1%	2,4,5 trichlorophenol	8
1½%	"	18
2%	"	12
	Control	52
	Packed and Waxed	60
1%	0-Aminophenol	8
2%	"	2
3%	"	8
4%	"	4
1%	p-nitrophenol	52
1½%	"	50
2%	"	66
½%	2,4 dinitrophenol	86
1%	"	34
2%	"	18
2%	dehydroacetic acid	18
3%	"	20
4%	"	10
5%	"	10
5%	Palmitic acid	64
7%	Palmitic acid	46
10%	"	46
	Control	40
	Packed and Waxed	40
2%	Phenylurethane	8
3%	"	0
5%	"	8
2½%	2 aminopyridine	2
3%	"	2
4%	"	2
2%	Sodium-o-phenylphenate	8
2½%	"	6
3%	"	12
	Control	29
	Packed and Waxed	32

Homestead, Florida, and the Nevins Fruit Company, Titusville, Florida. The varieties consisted of Hamlins, Connors and Valencia.

Experimental Results

The results of the tests are shown in table I. The compounds were tested in the order shown in the table except that those tests with different times of incubation or different concentrations were started a month apart.

Some of the compounds which gave a control of 26% or better were so injurious to the fruit that their practical use is doubtful. These are: 2,4-dinitrophenol,96% control but killed the fruit; o-nitrophenol, 32% control caused severe rind injury at 2%; aminoazobenzenehydrochloride, 26% control but stained the rind a dark red.

Three percent dibromo-8-hydroxyquinoline (44% control) and 2-methyl-1, 4-naphthoquinone (28% control) were so insoluble in the solvents used that it is doubtful that a solution strong enough to be more effective could be obtained within a practical temperature range.

The compounds listed in table II with their respective percentage of control in these tests show some promise of being effective agents for the practical control of stem-end rot. All percentages are for tests run after a 24 hour incubation period. Percentage of control is computed as 100 (the percent rot of the checks) minus the percent total rot of each treatment lot.

Thiourea also gave 100% control but its use has already been banned by the Pure Food and Drug Administration.

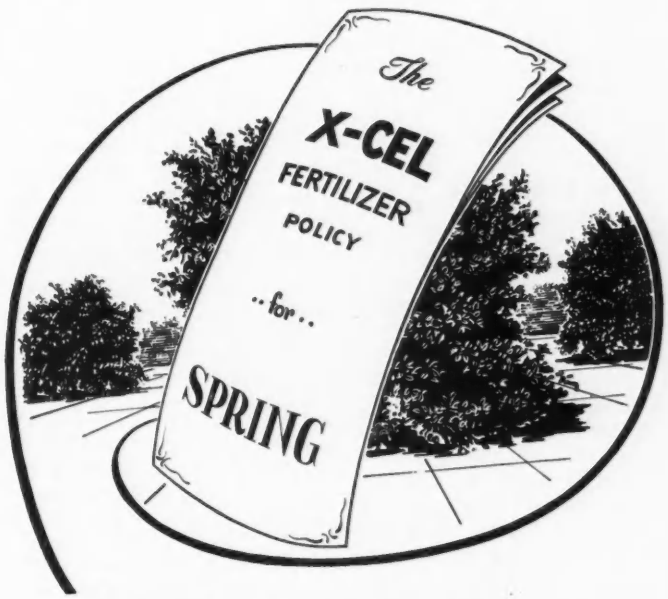
It is of interest to note that the effectiveness of 8-hydroxyquinoline, thiourea, thioacetamide, and thioacetanilide decreased sharply when the length of time of incubation increased from 24 to 48 hours (See Table I.) 8-hydroxyquinolinesulfate gave only 20% control at a concentration of 3% as compared with 100% control at 5% concentration. 2-aminopyridine gave no control at 2% and 92% control at 5% concentration.

Palmitic acid, o-aminophenol, 2-aminopyridine, thioacetamide, 8-hydroxyquinolinesulfate, and phenylurethane caused little or no rind injury. Sodium - o-phenylphenate and o-phenylphenol caused moderate rind injury. Dehydroacetic acid, 8-hydroxyquinoline, and thioacetanilide caused rather severe rind inpury. The injury caused by p-nitrophenol and 2,4,5-trichlorophenol was very severe.

Tests On Uninoculated Fruit

The thirteen compounds that gave the best results in the screening tests were tested with uninoculated grove run fruit. The Valencia oranges used were obtained from the Nevins Fruit Company, in the Indian River region. The compounds were tested at varying levels of concentration on unwashed fruit with fifty oranges in each test lot; and one hundred oranges in each check lot. A check lot of fifty waxed and packed fruit were also included in each test. The dipping procedure used was the same as that used above.

The results summarized in Table III were not entirely consistent with the results of the screening tests on inoculated fruit. p-nitrophenol and palmitic acid gave no control in this test. The percentage of fruit rot from all concentrations of these two compounds was higher than that of the controls. 2,4-dinitrophenol caused as severe rind



Stamina for Spring Bloom . . .

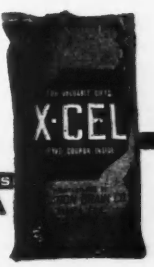
. . . Damage caused by high winds is long lasting and has affected most groves. Damage to tops is evident now but root damage is hidden. Root damage is serious. Shaking of trees in the ground has caused many broken roots with the danger of severe root rot.

. . . Help your trees to repair this damage. Provide the trees now with the necessary plant food to build stamina for heavy bloom and fruit set next Spring.

. . . There is an X-CEL Fertilizer that will do the job for you—one that will meet your exact requirements as to soil and crop condition.

. . . Ask the X-CEL Man to help you plan for the best results and the greatest economy.

Apply Calcium Nitrate in early Spring to help set a larger crop of high quality fruit.



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injury at ½% as at 2% concentration. 8-hydroxyquinoline sulfate, o-phenolphenol, and 2,4,5-trichlorophenol were not as effective in this test as in the previous tests. Of the other compounds tested phenylurethane, 2-aminopyridine, thioacetamide, thioacetanilide, and o-aminophenol gave consistently good results at all concentrations used. 8-hydroxyquinoline and dehydroacetic acid were more effective at the higher concentrations.

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Frank Stirling, Prominent Florida Horticulturist, Dies

Frank Stirling, 72, one of the founders of the community of Davie and among the most prominent horticulturists in the state, died November 12 at his home in Davie.

Mr. Stirling was a former representative to the state legislature from Broward county and was president of the Florida Horticultural Society, one of the oldest organized groups in the state.

He was a graduate entymologist, but devoted most of his life to agricultural and horticultural pursuits. He conducted a citrus fruit packing plant at Davie and owned extensive grove lands. In addition he was known as an outstanding expert on roses, which he also grew extensively.

Death came suddenly, at his home, after only a brief illness.

Mr. Stirling was a leader in civic and charitable affairs in the county almost since the date of his arrival in 1919. He came there from Gainesville, where he was employed at the state university. He also had worked extensively in California.

Mr. Stirling was a native of Walla-Walla, Washington. He was a Mason and a Shriner, and belonged to the Kiwanis club and the Davie Methodist church. During the brief time when Davie was incorporated, Stirling served as mayor.

He is survived by his wife, Bernice, two sons, Hully and Walter, both of Davie; and one daughter, Mrs. William Gill, also of Davie. Three grandchildren, Bill Carl Stirling, Hully R. Gill, and Lynn Stirling, also make their home at Davie.

PREPACKAGING CITRUS HOLDS PROBLEMS FOR SHIPPERS . . .

The packaging of citrus fruits in take-home-size mesh bags has proved an advantage to the housewife and grocer but still holds problems for the shipper and handler, say plant scientists of the U. S. Department of Agriculture.

Reporting on a 2-year study of handling and transportation of prepackaged citrus fruits from Florida to eastern markets, John R. Winston, G. A. Meckstrouth, and G. Lee Roberts stress the need for techniques that will speed up packing and reduce handling. Their study demonstrates that prepackaged citrus must be given better care all along the line than is now accorded crated fruit.

Currently the greater part of the bagged crop is handled piece by piece, over and over again. While an automatic bag-filling machine is under trial in some plants, most bags are now packed by hand. Since the war there has been an increase in the number of conveyor systems installed to move the bags from the packers to cars for shipment.

The big need, according to this study, is for an economically satisfactory master container that can be used to cut down handling at the market as well as at the shipping point.

Commenting on two types of master containers now used in some packing sheds, the plant scientists say the 2-bushel wire-bound crate is satisfactory but adds to the container cost. The kraft multiwall bailer or overbag is also structurally satisfactory but greatly retards cooling, which in turn promotes decay.

The plant scientists point out that much extra handling could be eliminated in packing houses not equipped with conveyors if the bagged fruit were placed in the crate by the packer and then handled like any other crated fruit. Bagged oranges in crates cooled more satisfactorily and received less bruising and crushing in transit than those in cars where the bags were loaded solid.

HERE IS A NEW ONE

If a Des Moines, Iowa, firm has its way, orangegg will soon replace eggnog as a Christmas and New Year's wassail. Orangegg, according to a recipe in Country Gentlemen, is made as follows:

Beat one fresh egg, add eight ounces of orange juice, beat some more, and pour. According to the sponsors, that's all.

During The Holidays... Or At Any Other Season

Practically everyone appreciates the best in the fruit they buy . . . . or for that matter any food products they use . . . . which accounts for the stress which has been placed upon the desirabiltiy of raising the very highest quality citrus fruit over the past several years.

Everyone wants the best if they can get it without paying too great a premium . . . . and the production of highest quality fruit frequently can be accomplished with very little extra cost . . . . with the returns more than repaying this production differential.

Growers throughout the great citrus belt of Florida have found over the years that it is possible to produce the finest fruit at extremely low per box production costs, through the use of Florida Favorite Fertilizers.

All of which means that there is more profit to the grower in following the Florida Favorite Fertilizer program and in the use of our fine fertilizer products.

You need not take our word for it . . . . any one of our staff of Field Service Men will be glad to tell you the names of growers who have found the use of Florida Favorite Fertilizers most effective in establishing large yields of extra-special citrus fruit . . . . we urge you to investigate.

And to remember that our own fleet of trucks deliver your fertilizers to you when and where you want it.

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PRESIDENT'S ANNUAL ADDRESS

(Continued from page 5)

of economic importance makes it imperative to change the original scope which was much narrower than it is today. The original thought of the founders of this Society was to make it apply almost exclusively to orange growing, to citrus fruits and their allied subjects. But as the years have come and gone its scope has been considerably widened so that now it covers not only tropical but sub-tropical fruits, vegetables and many of the fruits of the temperate zone. This enlargement of its sphere has injected into it new relations and new problems.

The programs of the Society necessarily required the addition of several branches other than citrus. You will note that the PROCESSING SECTION of the Society dealing with the modern manner of handling processed fruits, an industry in itself that has practically revolutionized the marketing end of the industry, has a section to itself. The vast expanding of the production of winter grown truck crops has necessitated the establishing of the VEGETABLE SECTION. The many new varieties of tropical and sub-tropical fruits that are now being tried out in the state has made it advisable for the KROME MEMORIAL SECTION to be added and finally, the ORNAMENTAL SECTION dealing with ornamental plants such as vines, shrubs and trees used in landscaping and beautifying homes and estates. This all tends to prove that this Society has been and is trying to improve the lot of its farmers and fruit growers through practical and scientific investigations and dissemination of knowledge. The Society now reminds me of the American Association for the Advancment of Science, a national organization which has over a score of branch sections, each one dealing with its own particular subject.

As President of your Society I want to say that we are pleased to receive you here at this meeting, because of the fact that you are either interested or engaged in the first calling of man, and which must, of necessity, be the last in which he will be engaged—namely, to till the soil and nurse the tree. As a rule you have not received the proper proportion of the profits of your labors regardless of the fact that out of the earth come all riches. As stated before the endeavor of this Society is to try to learn not only how to grow more and better fruit and produce but how to transport and market it most profitably.

To give vent to the thought that has been growing in our minds for some years, that the most vital and far reaching questions now calling for solution by Florida producers were not so much cultural questions, not planting questions but marketing. What we need is a careful, concise and methodical study of this subject from a commercial point of view. It seems to me that what we are now needing most of all is information that will enable us to put our crops into the hands of the consumer at the least possible cost. We are now more and more needing a sort of horticultural political economy.

Horticulture is affected more or less by nearly every science, and by nearly every art. Every walk in life is affected by the agriculture of the country and in turn as we are able to take the advantage of the best of everything, will we be able to prosper.

It should be the province of this Society to teach every member of the Association what to grow and how to produce the best of everything. The old adage that, "There's plenty of room at the top", was never more true than it is in horticulture today. The man who markets the best product never has to complain of poor prices. It takes brains to do this, and brains will count whenever they are correctly applied.

During this meeting we are to be

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favored by a number of eminent persons, both scientific men and practical growers who will present to us addresses and papers during the progress of the meeting, as a glance at the program will show. I would like to express to these friends of the Society our sincere thanks for their kindness and our appreciation of their valued efforts. After all we have left our homes to come here to learn. We are here not alone for the mere pleasure we get out of the trip, that is a mere incident to the annual pilgrimage, neither are we here that we may accumulate a few more dollars by some sordid method; but we expect to go back home better qualified and better equipped mentally for the unceasing struggle in attempting to do what we are doing, in the right way. We also expect to be better men and women for having met again and visited with our distant friends and neighbors on common ground for argument and discussion.

CITRUS COVER CROPS

(Continued from page 7)

the grower seeking lower production cost. It is adapted for use in bringing your groves into production, because of the large amount of nitrogen it adds to the soil. For the same reason, it should be valuable in old groves, where conditions permit its growth.

Here is some data taken from a 25 year old grove. The variety is Conner's seedless orange on rough lemon rootstock. The soil type is Lakeland fine sand. The trees are spaced 25' x 30'.

For the past fifteen years the grove has received nitrogen and potash as a fertilizer, no phosphate. The minor or secondary elements have been made in the fertilizer applications. Dolomite has been used to keep the pH up.

The yield data for the past five years are as follows:

1945 -	6,503
1946 -	7,878
1947 -	11,255
1948 -	5,185
1949 -	19,800
1950 - Est.	20,000

This grove had Alice Clover in 1948 and indigo as a cover crop in 1949. The cultural practice has remained constant since 1946 with the exception of the cover crop.

Now I am not giving you this data and telling you that a legume cover is totally responsible for this large jump in production. No doubt it did help. The point I wish to bring out

(Continued on page 20)

TRUCK AND CITRUS CROPS

need water-soluble magnesia for healthy growth, profitable yields

To get the greatest profit from every acre of truck and citrus crops, many growers are now using large amounts of fertilizer containing water-soluble magnesia.

They have found that better results can be obtained by adding magnesia to get a proper balance of plant foods rather than by using larger quantities of nitrogen, phosphate and potash alone. It also replenishes the magnesia which is rapidly lost by heavy cropping and leaching on light, sandy soils.

Symptoms of magnesia deficiency can frequently be seen in vegetables in many areas. Where extreme magnesia deficiency occurs, the green color of the lower plant leaves except for the veins fades to yellow or white before maturity.

One of the most practical and economical ways to supply quick-acting soluble magnesia is with *Sul-Po-Mag*, a natural combination of water-soluble magnesia and sulfate of potash. It is recommended for cucumbers, snapbeans, okra, cabbage, celery, white and sweet potatoes, watermelons, other truck crops and citrus.

Leading manufacturers are including *Sul-Po-Mag* in their fertilizer mixtures. The proper amount of *Sul-Po-Mag* will vary according to the needs of your soil. Many growers are using vegetable fertilizers containing 2 to 4% water-soluble magnesia from *Sul-Po-Mag*. For citrus, one unit of magnesia to each unit of nitrogen in the fertilizer is recommended.

For healthier growth, larger yields and added profits from truck and citrus crops, ask your dealer for fertilizer containing *Sul-Po-Mag*.

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Reports Of Our Field Men . . .

SOUTHWEST FLORIDA
Eaves Allison

Good rains over this area in the middle of November gave much needed moisture to some groves and crops and some not-so-much needed misture to others. The volume of rainfall seemed to be greatest from Sarasota south, with the Fort Myers, Immokalee areas receiving excessive amounts. At Palmetto and Ruskin the rainfall was just right, and the Arcadia area had ample to excessive amounts. Vegetable crops are about as usual for this time of year, allowing for the bad start due to heavy early season rains. Celery is coming along good as is the gladioli crop. No volume of citrus fruit has yet moved although some hamlins and ruby red grapefruit are almost "fitten" to eat at this writing. It will be like old times to see early varieties yellow on the tree.

WEST CENTRAL FLORIDA
E. A. (Mac) McCartney

The Fall application of fertilizer is well under way with growers showing a great deal of interest in mixtures that will insure them plenty of tree vitality to set a good crop of fruit next spring. Some growers are planning a late Fall application and may pass up their Spring topdresser while others are applying a well balanced mixture and realizing the importance of the Spring application will come back with the important topdresser. Early varieties of fruit are being moved and prices while not high have been to some extent satisfactory. Most growers that have grapefruit feel that they are going to hold on to them for higher prices and in this respect they are probably wise for indications are there will be no shortage in the demand for this variety of fruit. The vegetable situation is coming along in good shape. There was a little cold or frost scare during the latter part of November, but there was very little damage. Some varieties of our Fall vegetable crop are moving to market at this time.

POLK COUNTY
J. M. (Jim) Sample

We are moving a considerable volume of fruit at the present time and while prices are not as high as they were several weeks ago, they are still above those at this time last year and the year before. At this stage of the game it is somewhat difficult to predict how these prices will be maintained throughout the season but there is a general feeling of optimism among growers that we will experience a profitable season. The future for grapefruit prices looks very encouraging and are now at a very satisfactory level. The tangerine picture is not as bright now as it was several weeks ago, with practically all groves carrying extremely small sized fruit. We are about through with the Fall fertilizer application with most growers applying well balanced mixtures. We had some badly needed rains during the early part of November that were very beneficial as some growers had started to irrigate. There is a large demand for groves for sale by real estate operators but there is little property changing hands as owners are not willing to sell their grove property even at the high prices being offered.

NORTH CENTRAL FLORIDA
V. E. (Val) Bourland

As a general rule we start this paragraph by having something to say about citrus, but like Dagwood entering the backdoor for a change in routine, we are going to say, that our pastures are holding up extremely well this fall. This is particularly true in the case of improved pastures—those that have been planted to recognized grasses and well fertilized—and we are sure that this has been noticed by cattlemen throughout the territory. Cattle have not lost weight and this means profitable ranching to the owner. Early varieties of oranges are moving to market at various prices with small sizes and poor quality bringing much less than high quality fruit. Grapefruit, when it can be bought, either the seedy or marsh seedless, is bringing good money. The small sizes of tangerines have limited the shipments of this fruit. Quite a bit of grove fertilizer is being applied at this time and all groves have been worked up in good shape. Vegetable crops are doing very nicely, with cucumbers and cabbage planted to the largest acreage.

HILLSBOROUGH & PINELLAS COUNTIES
C. S. (Charlie) Little

Practically all packing houses in the territory are operating at the present time and while some are on only a part time basis we are still moving a nice volume of our early fruit. As to how the grower is feeling about prices, that depends to a large extent on what he was expecting before the season opened. Those growers that were expecting extremely high prices are disappointed, while those of us who realized that the very high prices were not entirely justified are content with the situation but very hopeful that it will improve as the season moves along. We have been busy with fall fertilizer application and getting groves worked up in tip-top shape. Some growers had to do some fall oil spraying for scale control, but at present time most of our insects are under control. Several growers throughout this section are planning to put in a crop of watermelons, and every indication at this time we will have a sizeable acreage.

SOUTH POLK, HIGHLANDS & HARDEE COUNTIES
R. L. (Bob) Padgett

Due to excessive storm damage we have had some pretty bad quality fruit go through our packing houses this fall and a large percentage of it has been diverted to canners. Prices have not been in line with what we expected to receive for oranges, but the demand for grapefruit is encouraging as most buyers are offering very nice prices. There are some crops of hamlin and parson brown oranges that still will not pass maturity standards. Most citrus properties have had their application of fertilizer and have been thoroughly cultivated both as cultural practice and to eliminate fire hazards. As a general rule most of our groves are in excellent condition. The vegetable growers as Istokpoga have had a successful fall crop, and there are now several very nice plantings of onions and radish that will soon be moving to market. The growers in Hardee County have had an in-and-out season due to weather conditions with some growers making money while others have had a loss.

Florida is lucky in havin' a lot of fine agricultural counties which produce a big hunk of the nation's supply of fruit and fresh vegetables . . . and one of those counties is Polk county which raises more citrus than any other county in the United States . . . which is sayin' a big mouthful, but 'cordin' to statistics that's how it is.

Polk county packin' houses last season shipped approximately a third of the fresh oranges that went to market from Florida and shipped nearly five million boxes of the 12 million boxes of fresh grapefruit that went to market from this state . . . while in addition to the fresh fruit 25 out of the state's 62 major cannin' companies is located in Polk county . . . while the concentrate business is responsible for new plants bein' located in this same county for operation during the present season in addition to those which was goin' before.

The citrus industry in Florida in spite of all its troubles and conflicts today stands in better position for future progress than ever before in its history . . . we're not goin' to gloat over the misfortunes which have affected the citrus industry in Texas and California 'cause that ain't human . . . but the fact remains that Florida's citrus future has never been brighter than it is today.

We know a heap of business concerns that would like to see the potential possibilities for profit in a business where the same amount of capital was invested as can be expected out of a similar investment in citrus groves . . . so as we look at it the Florida grower on the average is a pretty lucky sort of a guy.

Not only has the market for fresh fruit consistently increased with the years . . . but especially during the war when the government was providing great quantities of citrus juice to our armed forces and to the nation's abroad an additional market was being created . . . and now with the frozen concentrate product coming importantly into the picture, and with other products being sought through research the market for Florida's crop will continue to grow.

Uncle Bill

CITRUS COVER CROPS

(Continued from page 17)

is that indigo will grow sufficiently well to be of considerable value in some of the older groves. Incidentally, I have a series of color slides of these groves I hope to show you if I can do so in my alotted time.

Most citrus experts will agree that it takes from 90 to 120 pounds of nitrogen per acre to produce a 400-box crop. It appears that hairy indigo will produce an average crop of 15,000 pounds green weight per acre per year. This will yield about 90 pounds of nitrogen per acre—when figured on the basis of a solid acre. So assuming, because of our cultural practices, that the crop actually covers only half of the acre area, we have a nitrogen yield of 45 pounds per acre from our cover crop, which is from one third to one half of the total nitrogen required to produce the crop.

Summing up, then:

Indigo is highly resistant to root-knot.

It appears that indigo is not a preferred host plant of pumpkin bugs.

Indigo should be seeded in the spring at the rate of 4 to 8 pounds per acre, depending on the method used.

Indigo does not require inoculation nor special fertilization when sown in citrus groves.

Indigo gives comparatively high yields of green weight per acre.

It appears from the limited amount of available information that indigo does not delay maturity in citrus.

Citrus grown in indigo cover crop appears to have higher solids and juice content.

Although large amounts of nitrogen appears to be released by indigo, current indications are that applications of fertilizer nitrogen will be necessary at certain seasons of the year.

Hairy indigo is still a comparatively new crop and there is a great deal to be learned about its effect on the soil and on the various varieties of citrus. So far, it looks mighty promising.

PLANT QUARANTINE ENFORCEMENT FROM A CUSTOMS VIEWPOINT

(Continued from page 9)

points and consist of cooked food. It is probable with the inauguration of non-stop flights and the installation of refrigeration on planes, uncooked fruits and vegetables may be carried in these stores. In fact, in some of the so-called "luxury" planes refrigeration facilities have been installed and rare and out-of-season foods, fresh fruit in particular have been found. The risk of introduction of major plant pests by this means is illustrated by the interception at Miami of live Mediterranean fruit fly larvae on six different occasions in fresh peaches, oranges and tangerines carried by Spanish airliners. **Anastrephe** species have been intercepted in mangoes from Puerto Rico and citrus fruits from the Argentine and Brazil in airplane stores.

The size and passenger capacity of aircraft engaged in international transportation is ever expanding. This will result in more non-stop flights direct from infested or infected territory and the carriage of larger supplies of food and stores, much under refrigeration. The increase in speed and carrying capacity of the freight liners is another threat to our agriculture. Material may be plucked in the field in the morning and arrive in Florida in the afternoon. Pineapples, avocados, okra, tomatoes, eggplants, and other vegetables from the West Indies and Central and South American countries are regularly transported through Florida ports as are cut flowers, orchid plants and ornamental shrubbery. The airplane has not only revolutionized transportation of passengers and cargo but has facilitated the introduction of pests and diseases harmful to our agriculture.

As the non-stop flights increase in number, this menace will become greater.

4. Baggage of passengers and crew.

Perhaps the greatest problem of enforcement occurs with articles arriving from foreign ports in passengers' and crews' baggage. As stated before, to avoid duplication of effort, in Florida the examination of foreign material for all purposes is conducted

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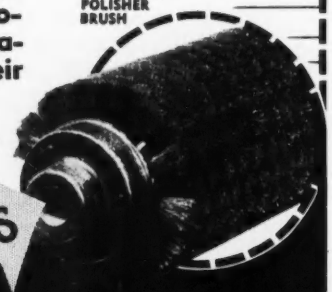
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by the Customs officers. Plant quarantine inspectors are on duty in the baggage examination rooms and many fruits, vegetables, plant material, seeds or other forms of plant life found by the Customs inspectors are delivered to the Quarantine employees. Customs and Plant Quarantine afford twenty-four hour service at the Miami International Airport. At other airports and piers where surface craft dock, Customs and Quarantine officers afford service outside of the regular office hours of 8 a. m. to 5 p. m. in emergencies and as the necessities of the service require.

Certain types of immigrants on arriving in the United States almost invariably have some form of plant life, fruit or vegetables in their baggage, clothing, or on their persons. One wonders at the ingenuity displayed in the attempt to import this material into the United States by this means. Fruits, vegetables, cuttings, plants, and nursery stock have been found concealed in the pockets of overcoats and women's coats; the pockets and linings of dresses and all sorts of schemes are evoked with the hope that such material will pass without detection.

(Concluded Next Issue)

"ORCHARD MONKEY" BEING TESTED AT WINTER HAVEN

The "orchard monkey," a mechanical device for hervesting tree fruits, is being given a practical test in citrus groves in the Winter Haven section. The tests in Florida are being conducted by Harold Brock of Portland, Oregon, inventor of the device.

The "orchard monkey" is a machine with four arms extending from the central mechanism. Each of the four arms is capable of carrying one man. The machine is driven to a position where the arms are facing a citrus tree. Each picker can then control the movements of his transporting arm and place himself in a position to pick from the top of the tree or down to about half the height of the tree. A fellow picker on the ground gathers all fruit within his reach.

Due to the difference in the sizes of California and Florida citrus trees, and the difference in widths of corridors between the rows, it has been necessary to conduct time tests here despite the favorable showing of the machine in California and in the apple sections of Washington and Oregon.

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stands for INTERIOR QUALITY — and whether your fruit goes to market or to a processing plant, flavor and juice content earn the premium returns. GOOD fruit stems from good care of your trees — including the right plant foods in the right amounts at the right time. DEPEND ON GULF for fertilizers that are right for your grove . . . . for dependable insect and disease control materials . . . . and for complete Field Service that helps you produce better fruit. Ask your local GULF Field Man to call now to aid in planning for your next crop.

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UHSDA ISSUES PUBLICATION ON FROZEN FOOD MARKETING:

Frozen food marketing is described and analyzed in a publication releaser recently by the U. S. Department of Agriculture's Production and Marketing Administration. The report entitled, "Marketing Frozen Foods — Facilities and Methods," deals with frozen food storing, transporting, distributing, merchandising, and the role of processing plants, locker plants, and home freezers in the frozen food industry.

The report points out that the marketing of perishable food products in frozen form has grown rapidly, although many basic problems must still be solved if marketing is to be brought to a high level of efficiency. Among the industry's problems are several centering on facilities. Buildings which were not designed for handling frozen foods are being used for wholesale plants. Many wholesalers do not have an adequate amount of properly located refrigerated storage space. According to the report, the system for distributing frozen foods must be made more efficient before substantial increases in business volume can be made. One of the big needs of the industry is low cost transportation capable of holding frozen commodities at a temperature of zero on long and short hauls.

Because retail stores generally lack freezer storage space, wholesalers must usually deliver to retail outlets in less than case lots. If retail stores were equipped with freezer storage, the report points out, wholesalers could make larger and fewer deliveries and thus reduce the cost of distribution. This cost is still relatively high and amounts to a considerable part of the price consumers pay for frozen foods.

As the volume of frozen food business increases, marketing costs should decline, according to the report, which is based on information and data supplied by over 300 wholesale frozen food distributors, an equal number of retail stores, and many other frozen food enterprises throughout the country. The report also indicates specific needs for additional research in the marketing of frozen foods.

Copies of the report may be secured from the Information Branch, Production and Marketing Administration, U. S. Department of Agriculture, Washington 25, D. C.

DIRECTOR OF FLORIDA STATION NAMED TO TWO NATIONAL COMMITTEES

Director Harold Mowry of the University of Florida Agricultural Experiment Station recently has been named to two important national committees, in recognition of outstanding work by himself and the Station.

At the 63rd annual convention of the Association of Land-Grant Colleges and Universities, Director Mowry was named to a four-year term on the experiment station organization and policy committee, the executive body of this group.

Also, he is one of two experiment station directors on a national liaision committee preparing for public hearings in Washington in January before the Pure Food and Drug Administration on tolerance for the new insecticides and fungicides.

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